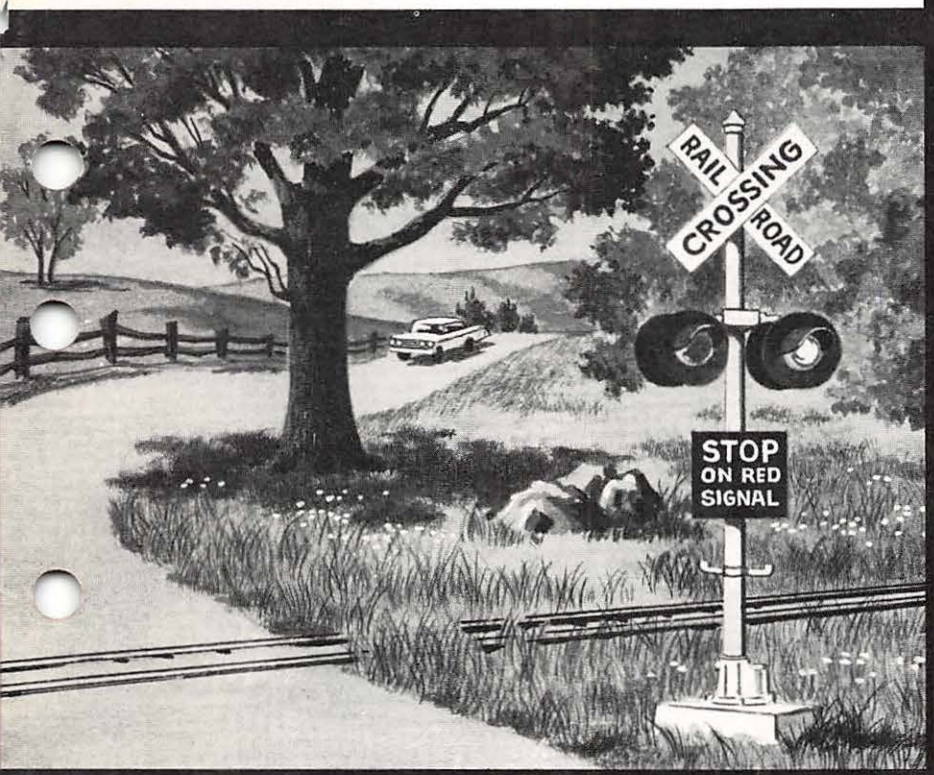
UNION DEVELOPMENT NO. 299

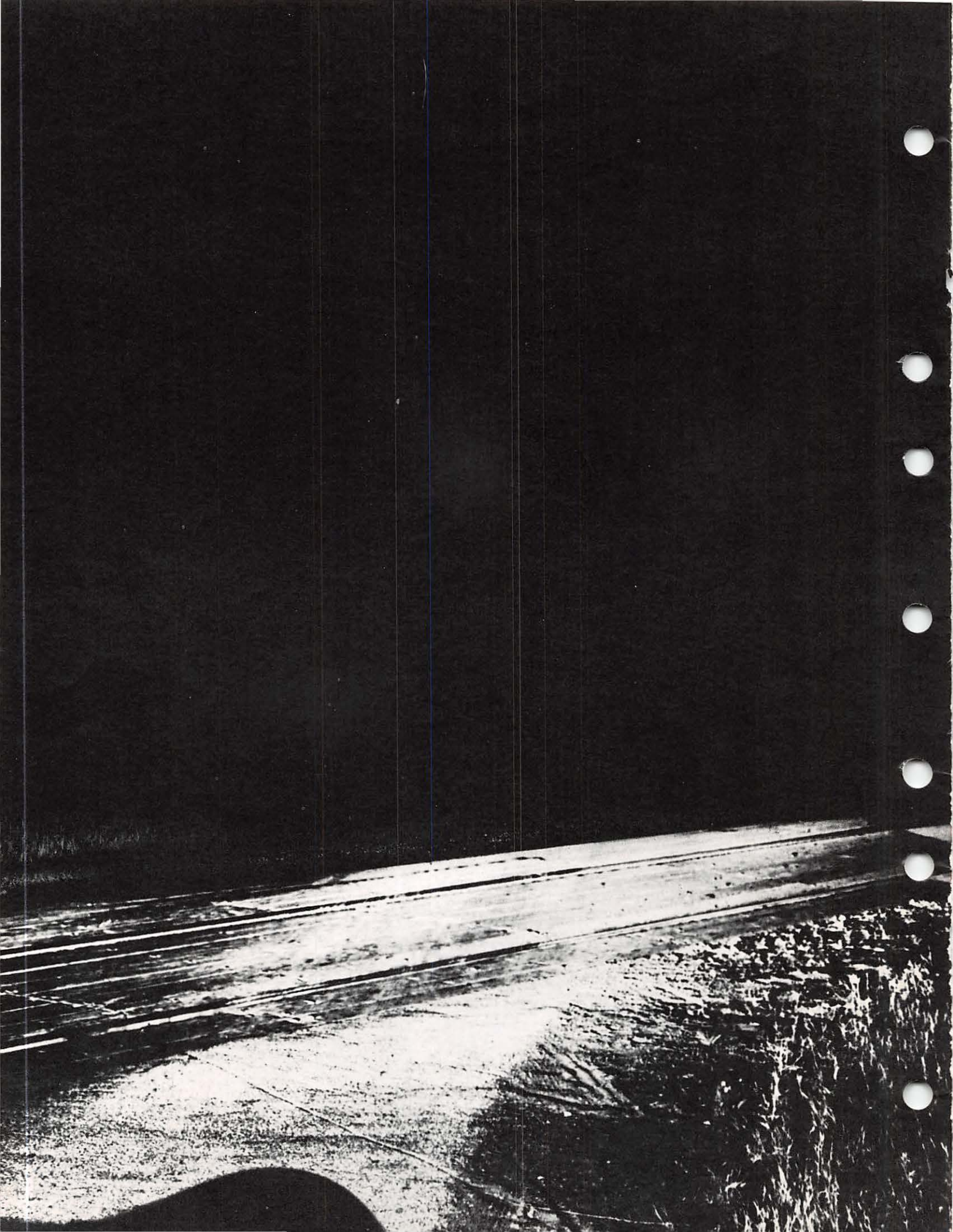
WABCO

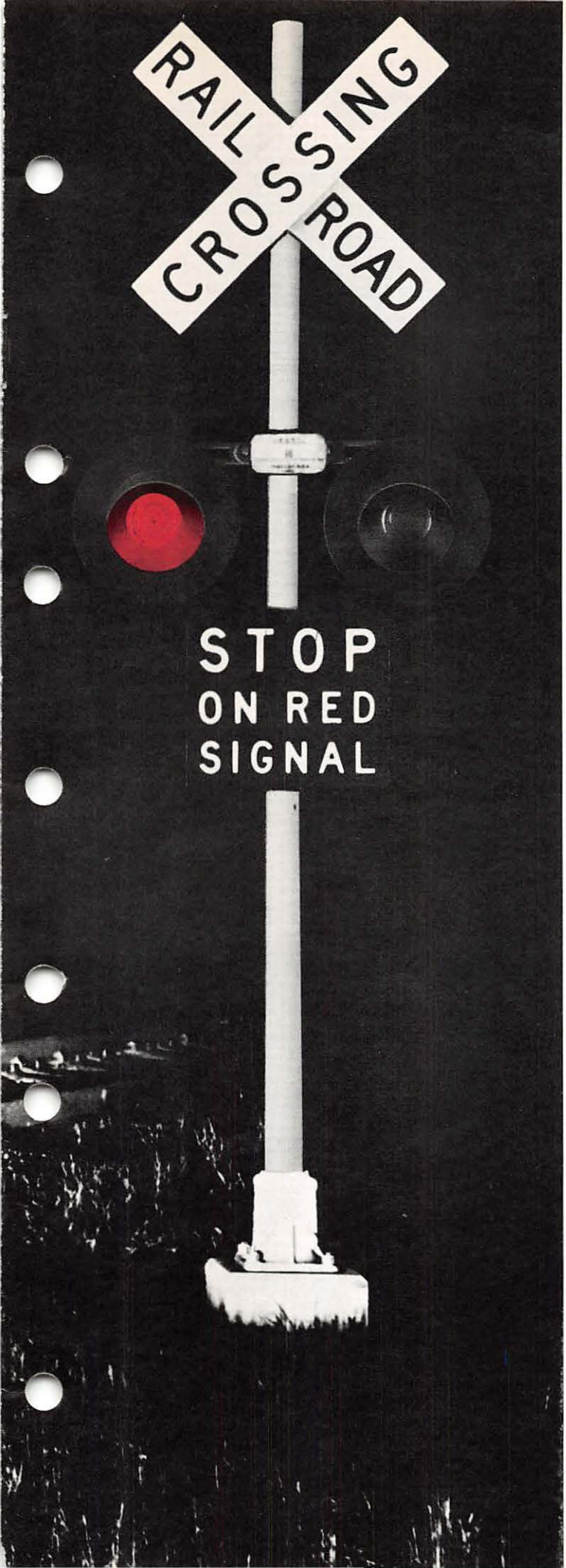
UNION SWITCH & SIGNAL DIVISION

PITTSBURGH 18, PENNSYLVANIA/Westinghouse Air Brake Company



AUTOMATIC HIGHWAY GRADE CROSSING PROTECTION PACKAGE





INTRODUCTION

This UNION Automatic Highway Crossing Protection equipment is designed to provide in one, economical "package" all major items of equipment required to protect one highway grade crossing over a single track.

This package is designed for application in non-signaled territory at isolated highway crossings, for crossings on branch lines, or for mill, mine or industrial plant railroads which cross routes of other vehicular traffic.

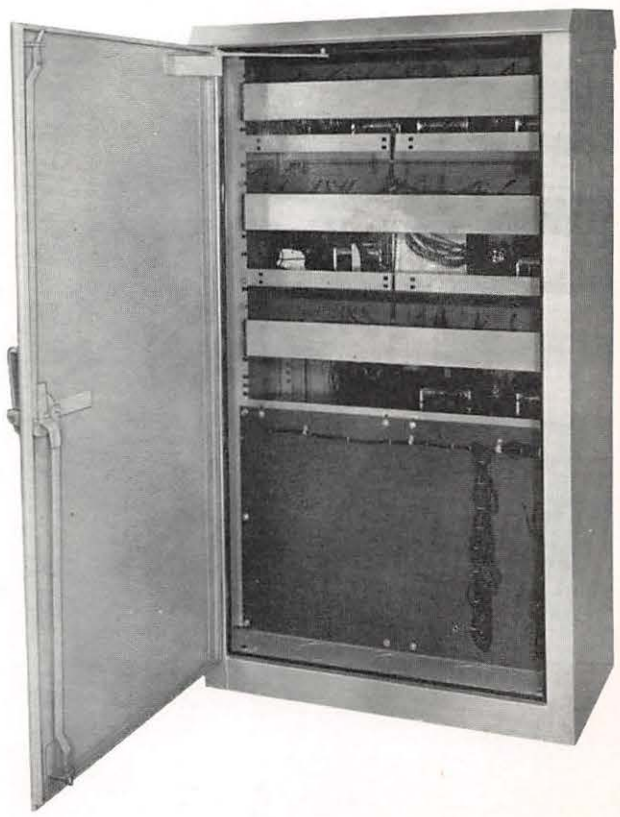
DESCRIPTION

FIGURE 1. . . . The front of the Automatic Highway Grade Crossing Protection Package

The basic component in the package is a 3-ft. - 3-1/2 inch Style RS instrument case with shelf-mounted relays, and other associated apparatus required for the control system except storage battery and track fittings. See Figure 1. The instrument case features hinged front and rear doors so that apparatus and wiring can be checked easily and quickly from either side. The case is provided complete with base cable outlet, aerial cable outlet with eye bolt, ground terminal and cast iron foundation piers. The instrument case is provided with three shelves each provided with a wire trough at the rear for ease of installing and handling its associated group of wires. This makes it possible for one man to install or check equipment and wiring from either the front or rear of the instrument case. See Figure 2.

Additional equipment included in the package consists of two 4-unit flasher signals complete with junction box and crossarm unit, aluminum reflex-reflective "Railroad Crossing" and "Stop on Red Signal" signs, pipe post, and a clamp-type base. See Figure 3.

FIGURE 2. . . . The rear of the Automatic Highway Grade Crossing Protection Package



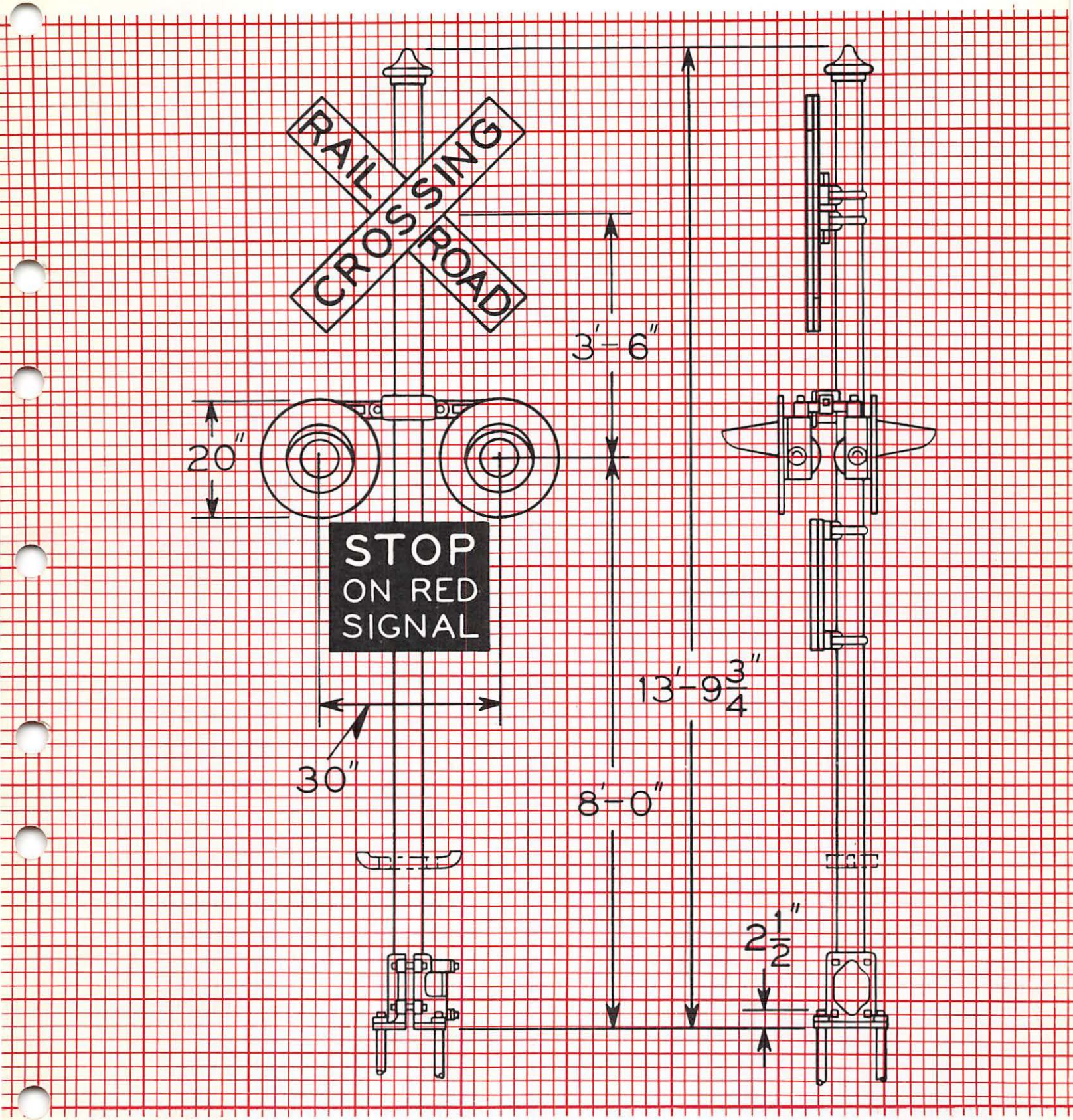


FIGURE 3

CIRCUITS

Circuits in the basic package are arranged for a single track highway crossing installation in non-signaled territory using flasher signals, Type "C" track circuits, directional stick relays, and storage battery for relays and standby lighting.

This new package uses Type "C" track circuits. See Figure 4. The use of the Type "C" track circuit, which provides high shunting sensitivity, makes it possible to install practically all of the apparatus at the crossing, because with this type of circuit no power supplies at, or line wires running to, the far ends of the two approach control track circuits are required. This concentration of equipment at the crossing keeps installation, labor and materials at a minimum, and also facilitates installation, inspection and maintenance.

In an installation having adjacent crossings, the use of the Type "C" track circuits permits the installation of a relay at the rectifier end of the track circuit and eliminates the need of a cable run between cases usually required for track repeater relays.

An approach pickup directional stick relay circuit is used because it will "clear out" a track circuit failure at either end by converting the system to area warning as soon as a train occupies the opposite approach.

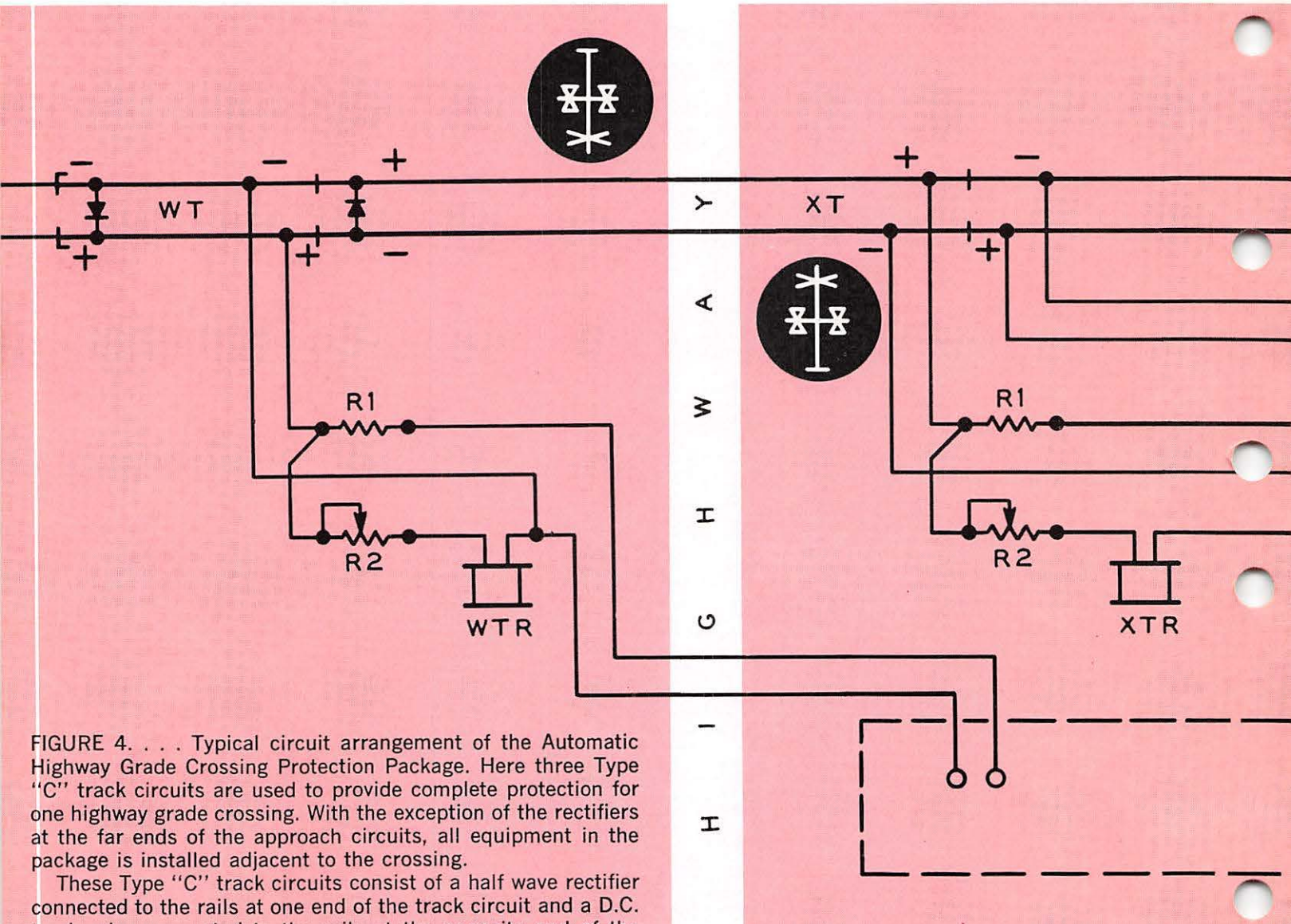
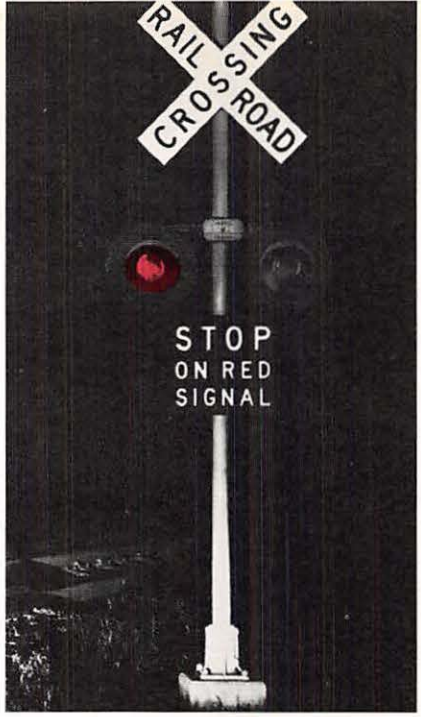


FIGURE 4. . . . Typical circuit arrangement of the Automatic Highway Grade Crossing Protection Package. Here three Type "C" track circuits are used to provide complete protection for one highway grade crossing. With the exception of the rectifiers at the far ends of the approach circuits, all equipment in the package is installed adjacent to the crossing.

These Type "C" track circuits consist of a half wave rectifier connected to the rails at one end of the track circuit and a D.C. track relay connected to the rails at the opposite end of the track circuit. Power is supplied to the track circuit by an inverter. Fixed resistor R1, in series with the inverter, functions as a current limiting resistor. Variable resistor R2 provides shunting sensitivity adjustment

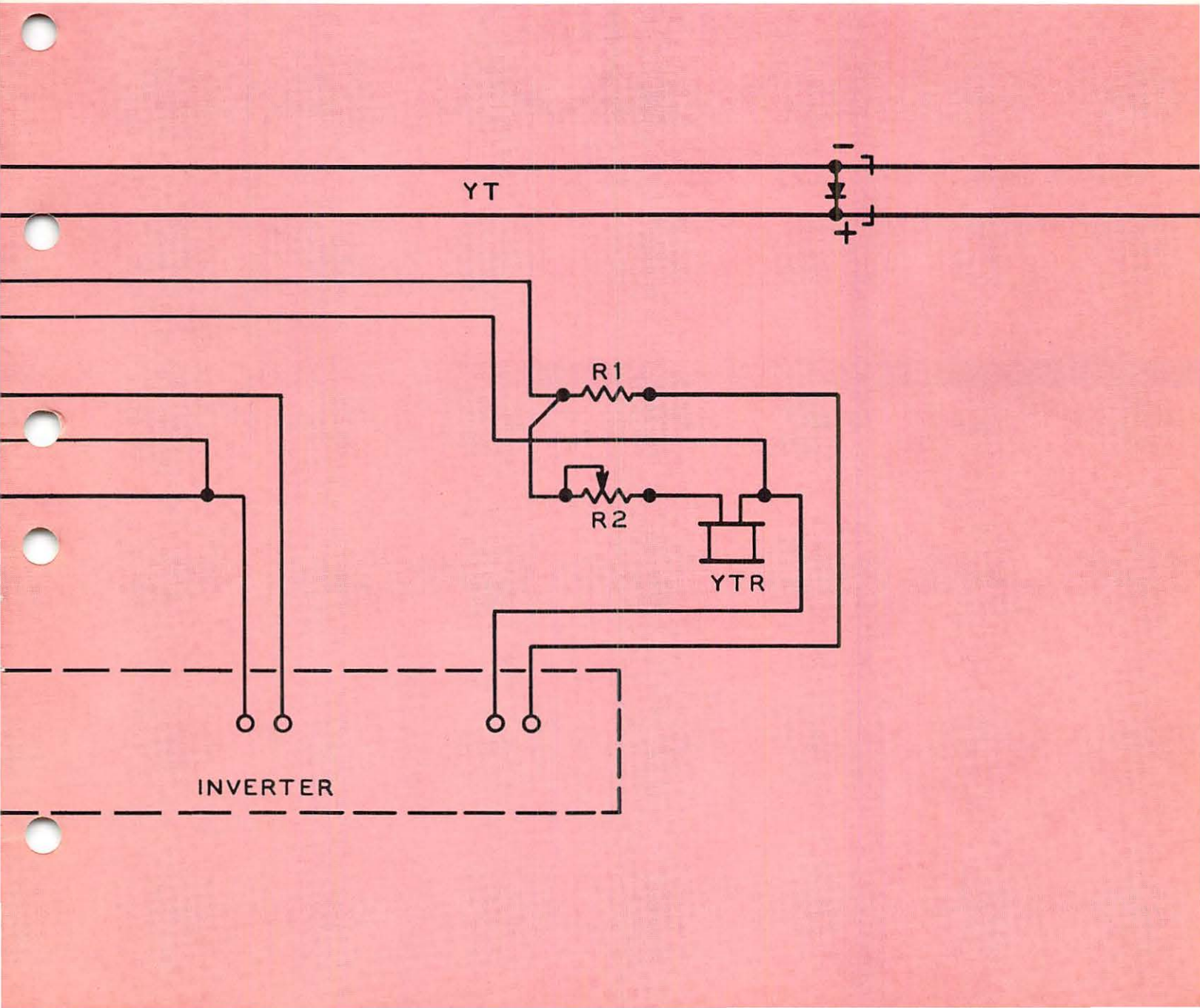
Power Requirements

The package operates normally from a 110-volt A. C. power supply. In the event of a failure of this primary power source, a storage battery-powered inverter is provided to maintain operation of the installation until the 110-volt A. C. power is restored.



Equipment Package

This highway grade crossing protection equipment is available either as a complete factory-assembled package ready for installation upon delivery, or in sections for assembly in the field.



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